COMMONWEALTH of VIRGINIA

WRLL for your file
Pell

A Rare Plant Inventory of Selected Powerline Right-of-Way Sites in Virginia

Submitted to:
Virginia Power
Department of Environmental Policy and Compliance
and Department of Forestry

Virginia Department of Conservation and Recreation
Division of Natural Heritage
Natural Heritage Technical Report 97-8
May, 1997

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL AND RECREATIONAL RESOURCES

A RARE PLANT INVENTORY OF SELECTED POWERLINE RIGHT-OF-WAY SITES IN VIRGINIA

By:
Nancy E. Van Alstine, J. Christopher Ludwig, and Gary P. Fleming
VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION
DIVISION OF NATURAL HERITAGE
1500 East Main Street, Suite 312
Richmond, Virginia 23219

Natural Heritage Technical Report 97-8
May, 1997

Prepared for:

Virginia Power
Department of Environmental Policy and Compliance
Department of Forestry

This report should be cited as follows:
Van Alstine, N.E., J.C. Ludwig, and G.P. Fleming. 1997. A rare plant inventory of selected powerline right-of-way sites in Virginia. Natural Heritage Technical Report 97-8. Virginia Dept. of Conservation and Recreation, Div. of Natural Heritage, Richmond. 29 pp. plus appendix.

TABLE OF CONTENTS

Introduction 1

Natural Heritage Inventory Methodology 4

Results of the Rare Plant Inventory 5

Introduction to the site reports 6
- Berry Hill Diabase Flatwoods 7
- Gravelly Run Powerline 9
- Lower Arthur Swamp Powerline 11
- Nance's Shop Bog 13
- Possum Run Seep 15
- Reedy Creek Seeps 17
- Salem Run Bog 20
- Wrights Corner 22
- Wrights Corner South 24

Discussion 26

Acknowledgments 26

References 27

APPENDIX 1: Explanation of the Natural Heritage ranking system

LIST OF FIGURES

Figure 1. Overview of 1996 study area: northern section 2

Figure 2. Overview of 1996 study area: southern section 3

LIST OF TABLES

TABLE 1. RARE PLANT SPECIES FOUND DURING 1996 FIELD SURVEYS 5

INTRODUCTION

In 1995 the Virginia Department of Conservation and Recreation's Division of Natural Heritage (DCR-DNH) and Virginia Power initiated a cooperative effort to visit known rare plant species locations and search for new rare plant sites in the powerline rights-of-way of Virginia (Ludwig 1996). Powerline rights-of-way have been found to be refugia for currently rare plants adapted to the fire-maintained open canopy habitats that may have formerly covered large areas of some regions of Virginia a few hundred years ago. These currently rare open-canopy habitats included savannahs, pine barrens, woodlands and natural grasslands. Surveys were conducted in 1995 in powerline rights-of-way south of the James and Appomattox Rivers, from the Dismal Swamp west to eastern Halifax and Charlotte Counties, and the results were reported in Ludwig (1996).

In 1996, in a continuation of the cooperative effort begun in 1995, additional powerline sections were surveyed. These included additional powerlines south of the James River in Dinwiddie, Greensville, Prince George, Sussex, Isle of Wight and Chesterfield Counties, but also powerlines north of the James River in Caroline, Culpeper, Fauquier, Henrico, Charles City and Gloucester Counties. Figures 1 and 2 show the general locations of the lines surveyed in 1996.

Although powerline rights-of-way north of the James River are not known for supporting the variety of rare species that have been documented for sites south of the James River, the potential for certain rarities exists. The globally rare and federally designated Species of Concern (SOC) *Juncus caesariensis* (New Jersey rush) has been found in powerlines in Caroline and Charles City. The majority of the populations of this plant are found in the Pine Barrens of New Jersey, but scattered populations occur in Nova Scotia, Maryland, the Coastal Plain of Virginia and the mountains of North Carolina. The state rare species *Sarracenia purpurea* (purple pitcher-plant) is also known for powerline sites in Caroline County.

Powerlines in Culpeper and Fauquier Counties were targeted because they lie within the Triassic basin of Virginia's northern Piedmont, a region known to support rare species that are more common in the tall grass prairies west of the Appalachians (Fleming 1993). Probably formerly found in openings resulting from a combination of stressful droughty soils, bison grazing, and frequent fires (natural and human-set), the plant rarities have persisted in artificially-maintained openings such as powerlines, undisturbed railroad and roadside rights-of-way, and abandoned fields (Fleming 1993).

Work on the second year of the inventory began in July of 1996 with a comprehensive review of existing information on rare plants in the region, focusing on occurrences known in or near powerline rights-of-way. All field surveys were performed in August, 1996. During this period, Virginia Power and DCR-DNH personnel conducted six days of targeted surveys within the study area.

DCR-DNH is the state agency responsible by statutory authority under the Virginia Natural Area Preserves Act for inventory, database maintenance, protection, and management of Virginia's Natural Heritage Resources. Natural Heritage Resources are defined as "the habitat of rare, threatened, or endangered plant and animal species, rare or state significant natural communities or geologic sites, and similar features of scientific interest" (Virginia Natural Area Preserves Act, Section 10.1-209 through 217, Code of Virginia). The Division provides the only comprehensive attempt to identify the Commonwealth's most significant natural areas through ongoing scientific biological survey. Data gathered during this state-wide survey are assembled and managed through a sophisticated Biological and Conservation Data System (BCD) in which information on ecosystems and species, their biology, habitats, locations, conservation status, and

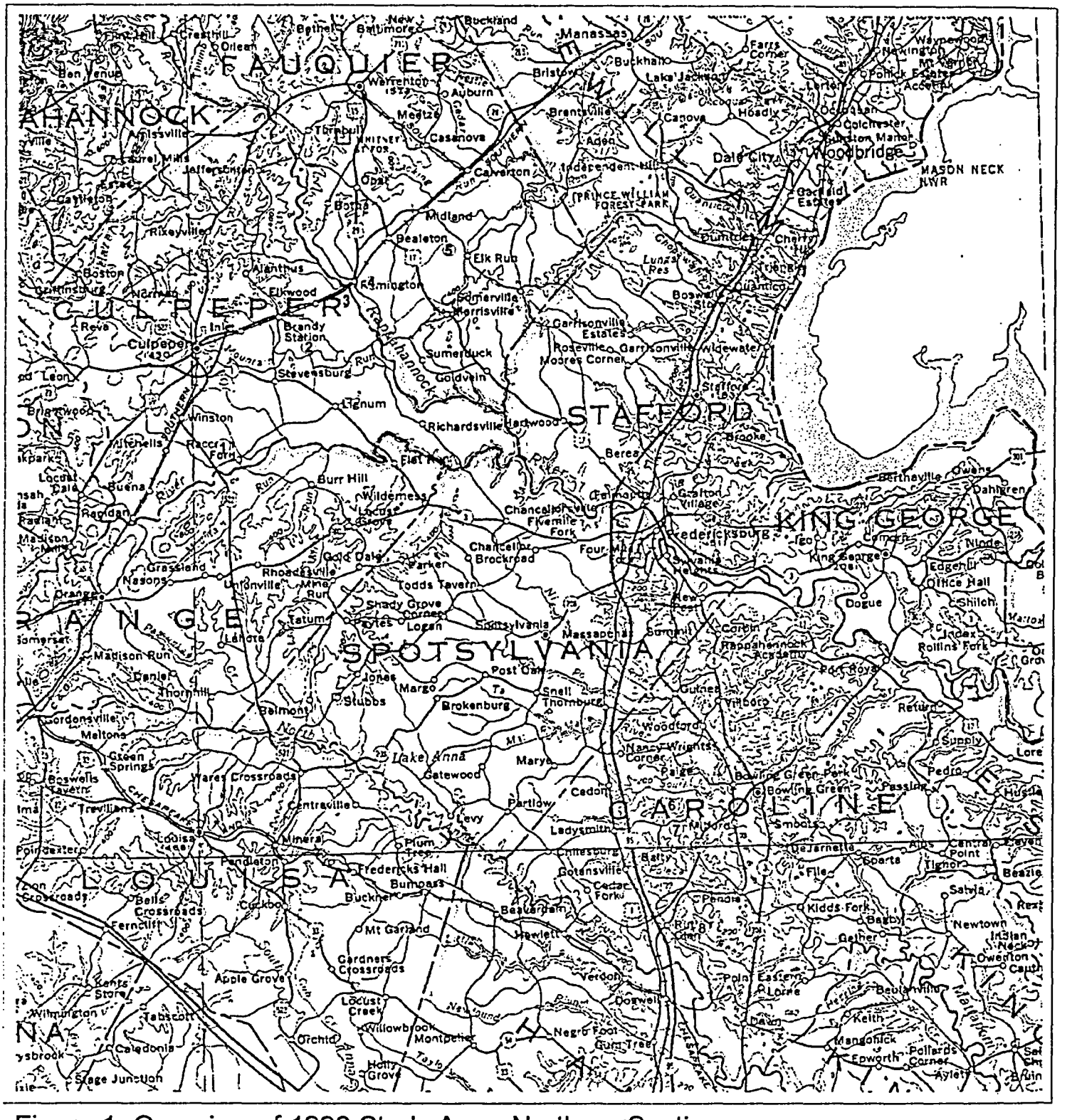


Figure 1. Overview of 1996 Study Area: Northern Section

Powerline Right-of-Way Sites Surveyed

1. Southern Culpeper Diabase Flatwoods
2. Berry Hill Diabase Flatwoods
3. Rt. 673 Diabase Hill Powerline
4. Remington East Powerlines
5. Elk Run Powerline
6. Wrights Corner
7. Wrights Corner South
8. Reedy Creek Seeps

N

10 0 10

Kilometers

DCR
Department of Conservation & Recreation

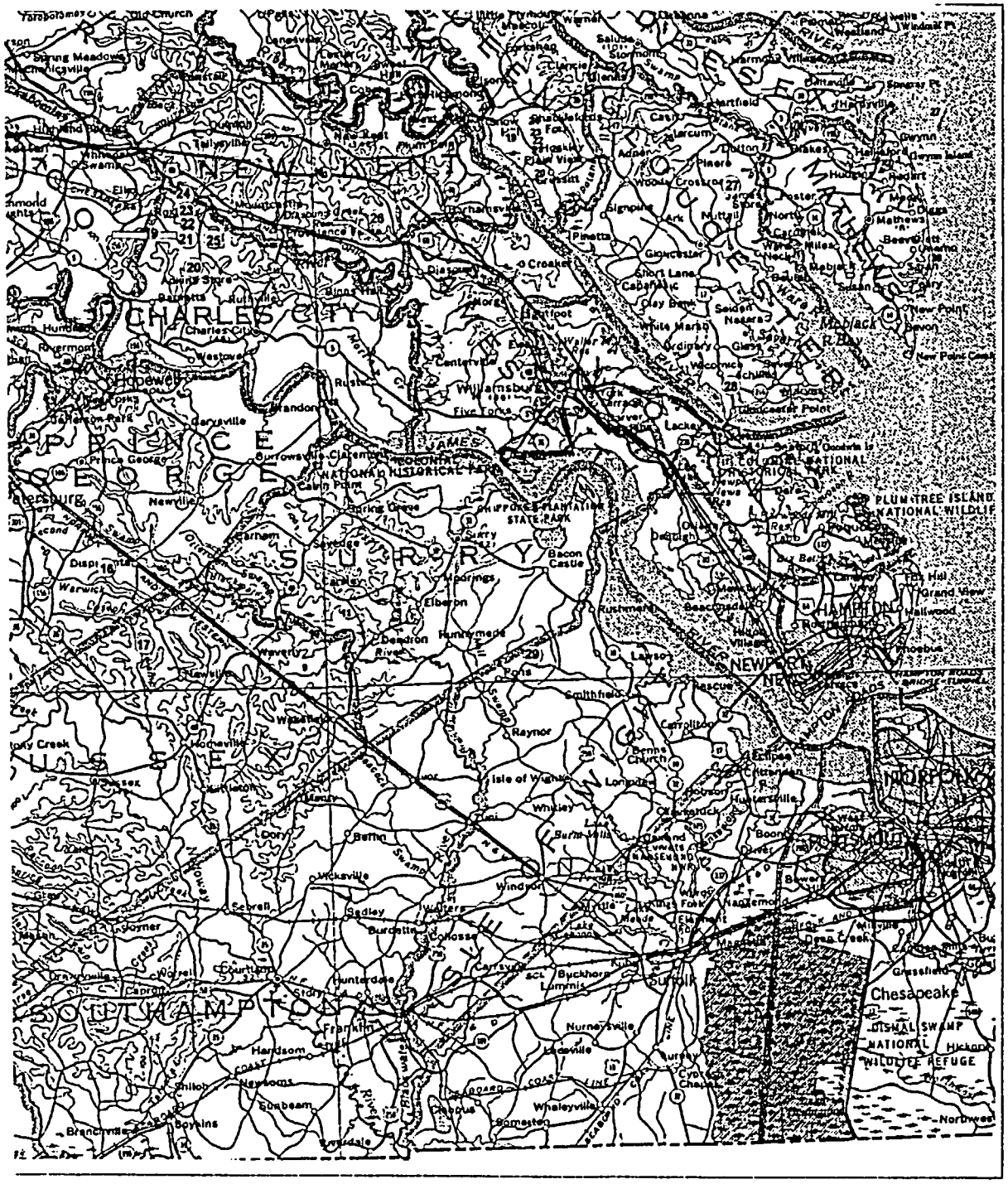


Figure 2. Overview of 1996 Study Area: Southern Section

① Powerline Right-of-Way Sites Surveyed

9. Cowie Corner
10. Otterdam Swamp
11. Rt. 630 Roadside Powerline
12. New Powerline
13. Gravelly Run Powerline
14. Lower Arthur Swamp Powerline
15. Upper Arthur Swamp Powerline
16. Warwick Swamp North Powerline
17. Joseph Swamp Powerline
18. Chesterfield Airport Powerline
19. Roxbury E-W Powerline
20. Salem Run Bog
21. Rt. 603 North Powerline
22. Rt. 106 South Powerline
23. Possum run Seep
24. Route 600 Powerline
25. Nance's Shop Bog
26. Windsor Shades Powerline
27. Pinero Flatwoods Powerline
28. Coleman Swamp Powerline
29. Belle Meadow Pocosin

N

10 0 10

Kilometers

DCR
Department of Conservation & Recreation

management needs is continually updated and refined. The Division is part of an international network of natural heritage programs, coordinated by The Nature Conservancy, which utilize standardized inventory methodologies and BCD technology.

NATURAL HERITAGE INVENTORY METHODOLOGY

Inventory in the Virginia powerline rights-of-way was conducted through the five basic stages listed below. Although the inventory can logically be broken into these steps, in actuality the work proceeded in multiple directions simultaneously and was often iterative.

1) Review of aerial photographs. Aerial photographs of the survey area were reviewed in detail to identify features to be studied in the following stages. To aid in their interpretation, the photographs were compared with topographic and geologic maps.

2) Gathering existing information. Museum collection information on rare plant species in the targeted areas of Virginia was reviewed by DCR-DNH staff. Published and unpublished information was collected and assimilated in conjunction with review of aerial photographs. Maps of lands within the survey area were gathered, BCD databases accessed, and the known distribution of natural heritage resources examined. Natural resource personnel and biologists knowledgeable about the area were consulted for additional information.

3) Planning for field survey. Based on preceding efforts, field plans were developed to maximize the productivity of the limited field time. Among the factors considered were: which rights-of-way had the highest likelihood for rare plant occurrences; when the survey could best be conducted; and how much time should be budgeted for completing the survey.

4) Field survey. During this stage, detailed information was collected on the rare plant species found in the powerline rights-of-way. During the field work, data were recorded during each survey including the site location, directions, and a site description, as well as land use, potential hazards, exotic flora and fauna, and off-site considerations. When rare plant species occurrences were encountered, additional data were recorded, including the date(s) when the species was found, population boundaries and concentrations within those boundaries, approximate number of individuals, reproductive and phenological status, and species viability. Habitat factors such as moisture, light, and associated species, as well as any apparent immediate or long-term threats to the occurrence were also noted.

5) Compilation of results and preparation of final report. As field work was completed, DNH biologists reviewed the information gathered and compiled the results on standardized field forms. All results of this inventory have been incorporated into the DCR-DNH Biological and Conservation Data System (BCD).

RESULTS OF THE RARE PLANT INVENTORY

Twenty-nine powerline right-of-way sites were visited in six days of inventory work. Figures 1 and 2 show the distribution of all of the survey sites visited and provide numbers which correspond to the site names used in this report. Figure 1 shows the more northern sites visited in Caroline, Culpeper and Fauquier Counties while Figure 2 shows the more southern sites visited in Charles City, Chesterfield, Dinwiddie, Gloucester, Greensville, Henrico, Isle of Wight and Prince George Counties. Among the 29 sites, 19 rare plant occurrences were found at 9 of the right-of-way sites. Table 1 summarizes these findings. Following Table 1, individual site reports present information about each site where rare plant species were found. Maps of the rare species locations are provided with the summaries.

TABLE 1. RARE PLANT SPECIES FOUND DURING 1996 FIELD SURVEYS

SCIENTIFIC NAME	COMMON NAME	HERITAGE RANK*	SITE NUMBER
Asclepias rubra	Red milkweed	G4G5/S2	14
Chelone cuthbertii	Cuthbert turtlehead	G3/S2	14
Juncus caesariensis	New Jersey rush	G2/S2	6, 7, 8, 20, 23, 25
Ludwigia hirtella	Rafinesque's seedbox	G5/S1	14
Mimosa quadrivalvis var. *angustata*	Little-leaf sensitive-briar	G5T5/S2	8
Panicum hemitomon	Maidencane	G5?/S2	13
Platanthera blephariglottis var. *conspicua*	Large white fringed orchid	G4G5T3T4/S1	8
Prunus pumila var. *susquehanae*	Susquehanna cherry	G5T4/S1	2
Rhynchospora cephalantha var. *attenuata*	Small capitate beakrush	G5T?/S1?	14
Sarracenia purpurea	Purple pitcher-plant	G5/S2?	8
Xyris difformis var. *curtissii*	Curtiss' yellow-eyed-grass	G5T5/S1	14

* See Appendix 1 for an explanation of natural heritage ranks.

INTRODUCTION TO THE SITE REPORTS

Brief site reports are provided for all sites where rare plants were located during this survey. The following standard reporting format is used for each site:

SITE NAME: Site names generally reflect a geographic locality and, in some cases, a prevalent landscape feature.

LOCALITY: The county (or counties) containing the site is listed.

QUADRANGLE: The name of the USGS 7.5' quadrangle(s) that includes the site is listed.

QUADRANGLE CODE: The code used by DCR-DNH for the quadrangle is listed. The first five digits of the code represent latitude and longitude (in degrees) of the quadrangle.

LOCATION: Location of the site, using geographical landmarks, is given.

RARE PLANT SUMMARY TABLE: This field provides a synopsis of the rare plant species found at the site, together with their rarity ranks (global, state), the legal status, both Federal (USFWS) and Virginia, and element occurrence ranks. See Appendix 1 for an explanation of Natural Heritage and legal ranks.

SITE INFORMATION: Information regarding the site and its rare plants is presented. In keeping with other Heritage inventory reports, the first reference to a species in a narrative is by scientific name, followed by its common name in parentheses. Subsequent references to the same species are by scientific name only.

SITE MAP: The site map, drawn on a copy of the USGS 7.5' quad(s), shows the location of rare plants identified during this inventory. These location maps are intended to provide resource managers with requisite site-specific information. However, since rare species are often sensitive to disturbance or may be sought out by collectors, we strongly recommend that this information not be shared with the general public or with persons not directly involved in the management of these sites.

BERRY HILL DIABASE FLATWOODS

LOCALITY: Culpeper County **QUADRANGLE:** Germanna Bridge **QUADRANGLE CODE:** 3807747

LOCATION: Transmission powerline right-of-way west of Rt. 669, ca. 2.2 km northwest of Berry Hill.

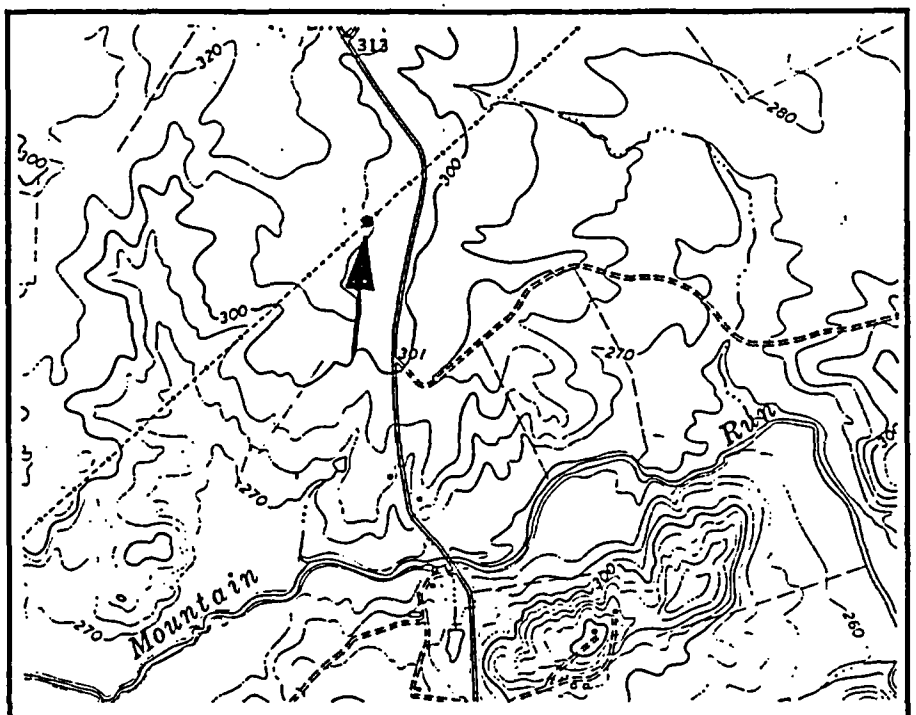
RARE PLANT SUMMARY TABLE

SCIENTIFIC NAME	COMMON NAME	GLOBAL RARITY RANK	STATE RARITY RANK	USFWS STATUS	VA LEGAL STATUS	ELEMENT OCCURRENCE RANK
Prunus pumila var. *susquehanae*	Susquehanna cherry	G5T4	S1	--	--	D

SITE INFORMATION: This section of powerline right-of-way cuts through an extensive, although occasionally harvested, tract of forest on a gently sloping plain characterized by Iredell soil (silty surface soil and an impervious, heavy clay subsoil) underlain by diabase, a basic rock. Open habitats over this soil type are known to support a variety of plant rarities in the Triassic basin of Virginia's Northern Piedmont physiographic province (Fleming 1993). The open, upland habitat of this section of powerline right-of-way supports a small colony of the low shrub *Prunus pumila* var. *susquehanae* (Susquehanna cherry). Associated species include *Toxicodendron radicans* (poison ivy), *Rubus flagellaris* (a bramble), and *Panicum anceps* (panic grass).

Current management of the powerline vegetation by Virginia Power appears to have benefited the rare species at the site.

BERRY HILL DIABASE FLATWOODS -- RARE PLANT LOCATION



Location of *Prunus pumila* var. *susquehanae*
Germanna Bridge USGS 7.5' Quad

N

2000 ft.

GRAVELLY RUN POWERLINE

LOCALITY: Dinwiddie County **QUADRANGLE:** Carson **QUADRANGLE CODE:** 3707714

LOCATION: Transmission powerline right-of-way ca. 2.2 km NW of State Rt. 675 at the headwaters of Gravelly Run.

RARE PLANT SUMMARY TABLE

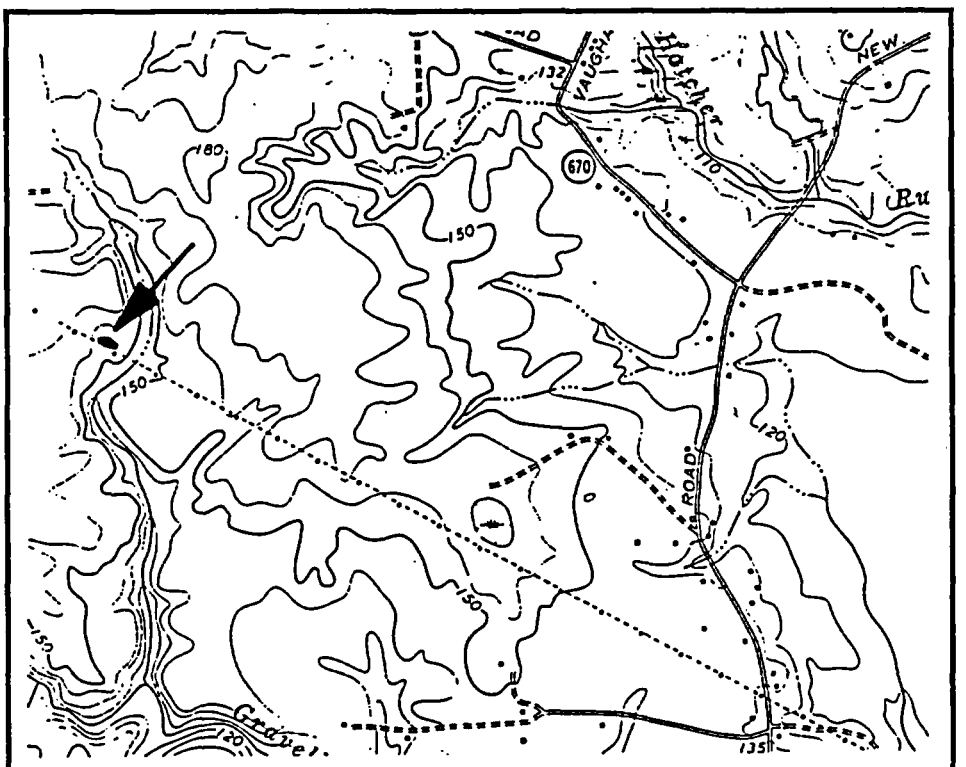
SCIENTIFIC NAME	COMMON NAME	GLOBAL RARITY RANK	STATE RARITY RANK	USFWS STATUS	VA LEGAL STATUS	ELEMENT OCCURRENCE RANK
Panicum hemitomon	Maidencane	G5?	S2	--	--	D

SITE INFORMATION: This site contains a section of powerline right-of-way with predominantly dry, gravelly-clay soils and upland herbaceous vegetation. Extensive pine silvicultures border the powerline. A low swale at the point where the headwaters of Gravelly Run crosses the right-of-way is seasonally wet and supports a colony of the rare grass *Panicum hemitomon* (maidencane). In August 1996, the colony covered approximately 10 square meters with vegetative culms, and no evidence of flowering or fruiting culms was found. This condition is not uncommon in populations of *Panicum hemitomon*, which reproduces vigorously from lateral buds on widely creeping rootstocks, thus rapidly colonizing most areas in which it becomes established by vegetative rather than sexual reproduction.

This is the northernmost record of *Panicum hemitomon* in the Virginia coastal plain and also represents a rather atypical habitat for the species, which is most frequently found in seasonal ponds and ditches.

Current management of the powerline appears compatible with the maintenance of favorable habitat conditions for this species.

GRAVELLY RUN POWERLINE -- RARE PLANT LOCATION



Location of *Panicum hemitomon*
Carson USGS 7.5' Quad

N

2000 ft.

LOWER ARTHUR SWAMP POWERLINE

LOCALITY: Dinwiddie County **QUADRANGLE:** Petersburg **QUADRANGLE CODE:** 3707724

LOCATION: Transmission powerline right-of-way south of State Routes 675 and the Seaboard Coast Line.

RARE PLANT SUMMARY TABLE

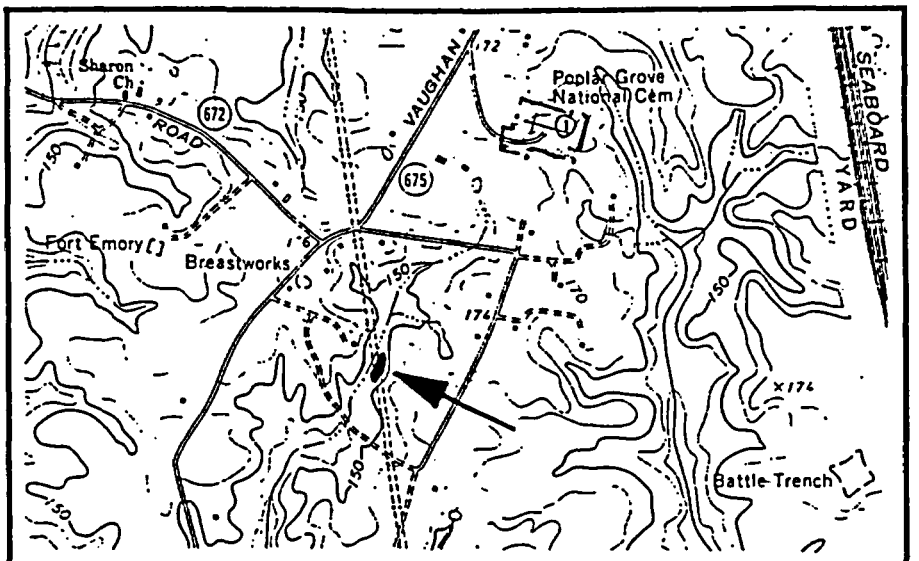
SCIENTIFIC NAME	COMMON NAME	GLOBAL RARITY RANK	STATE RARITY RANK	USFWS STATUS	VA LEGAL STATUS	ELEMENT OCCURRENCE RANK
Asclepias rubra	red milkweed	G4G5	S2	--	--	D
Chelone cuthbertii	Cuthbert turtlehead	G3	S2	--	--	D
Ludwigia hirtella	Rafinesque's seedbox	G5	S1	--	--	D
Rhynchospora cephalantha var. *attenuata*	small capitate beakrush	G5T?	S1?	--	--	C
Xyris difformis var. *curtissii*	Curtiss' yellow-eyed-grass	G5T5	S1	--	--	D

SITE DESCRIPTION: This section of powerline right-of-way features numerous low-nutrient sphagnous seepage areas in two wetlands within a shrub-dominated powerline right-of-way. The upper (northern) wetland provides habitat for all of the rarities except *Ludwigia hirtella*, which is found in the southern wetland.

The saturated, low-nutrient conditions in the seepage wetlands inhibit woody plant growth and, in the past when fires were frequent, this site probably featured uplands of pine savannah surrounding wetlands with shrub bog vegetation. These vegetation types would have featured scattered trees and suitable, open habitat for the rare plant species listed above. Currently, fire suppression is actively practiced and dense hardwood forests and pine plantations are the predominant vegetation throughout the region. At this site, rare plants still find suitable habitat in the open transmission line corridor.

Current management of the powerline vegetation by Virginia Power appears to have benefited the rare species at the site although the woody growth of the line has not been cut in at least three years and portions of the herb-dominated seepage areas are being shaded by woody species. Additional early-season survey for rare plant species is recommended at this site.

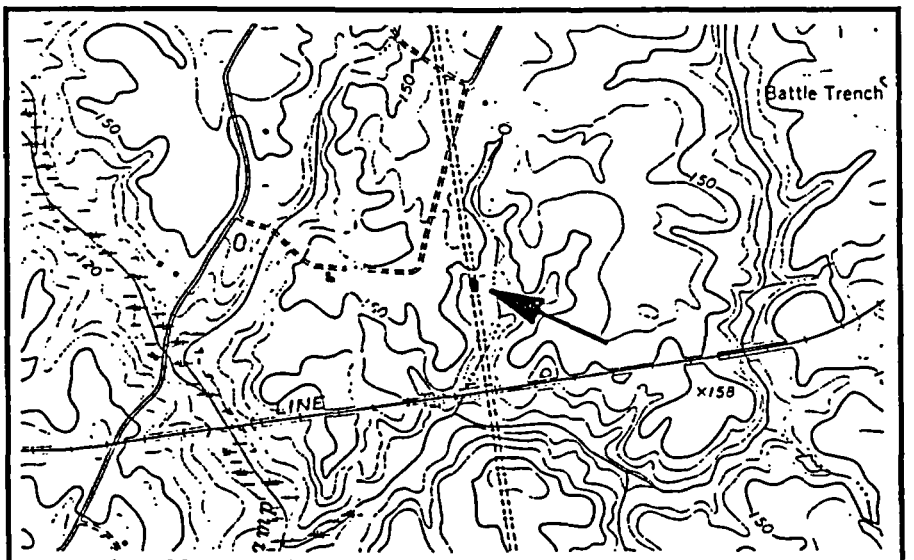
LOWER ARTHUR SWAMP POWERLINE -- RARE PLANT LOCATIONS



Location of *Asclepias rubra, Chelone cuthbertii, Rhynchospora cephalantha* var. *attenuata*, and *Xyris difformis* var. *curtissii*
Petersburg USGS 7.5' Quad

N

2000 ft.



Location of *Ludwigia hirtella*
Petersburg USGS 7.5' Quad

N

2000 ft.

NANCE'S SHOP BOG

LOCALITY: Charles City County **QUADRANGLE:** Roxbury **QUADRANGLE CODE:** 3707742

LOCATION: Transmission powerline right-of-way just east of State Routes 608 and south of state Route 631, due south of Edna's Mill.

RARE PLANT SUMMARY TABLE

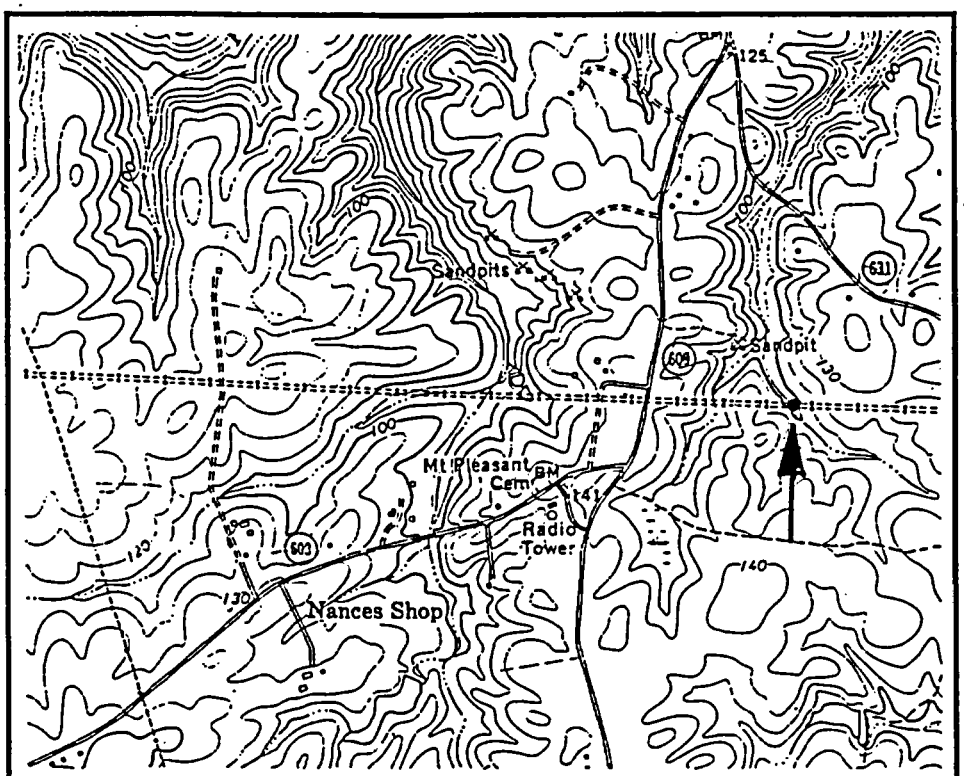
SCIENTIFIC NAME	COMMON NAME	GLOBAL RARITY RANK	STATE RARITY RANK	USFWS STATUS	VA LEGAL STATUS	ELEMENT OCCURRENCE RANK
Juncus caesariensis	New Jersey rush	G2	S2	SOC	--	BC

SITE DESCRIPTION: This section of powerline right-of-way features a low-nutrient, sphagnous seepage area in a swale within an herb-dominated powerline right-of-way. The wetland provides habitat for ca. 200+ individuals of the globally-rare plant and USFWS Species of Concern (SOC) *Juncus caesariensis* (New Jersey rush).

The saturated, low-nutrient conditions in the seepage wetlands inhibit woody plant growth and, in the past when fires were frequent, this site probably featured uplands of pine savannah surrounding wetlands with shrub bog vegetation. These vegetation types would have featured scattered trees and suitable, open habitat for the *Juncus caesariensis*. Currently, fire suppression is actively practiced and dense hardwood forests and pine plantations are the predominant vegetation throughout the region. At this site, *Juncus caesariensis* still finds suitable habitat in the open transmission line corridor.

Current management of the powerline vegetation by Virginia Power appears to have benefited the *Juncus caesariensis* at this site.

NANCE'S SHOP BOG -- RARE PLANT LOCATION



Location of *Juncus caesariensis*
Roxbury USGS 7.5' Quad

N

2000 ft.

POSSUM RUN SEEP

LOCALITY: Charles City **QUADRANGLE:** Roxbury **QUADRANGLE CODE:** 3707742

LOCATION: Transmission powerline right-of-way intersecting a northwest tributary of Possum Run, 2.3 km ESE of Hughes Store.

RARE PLANT SUMMARY TABLE

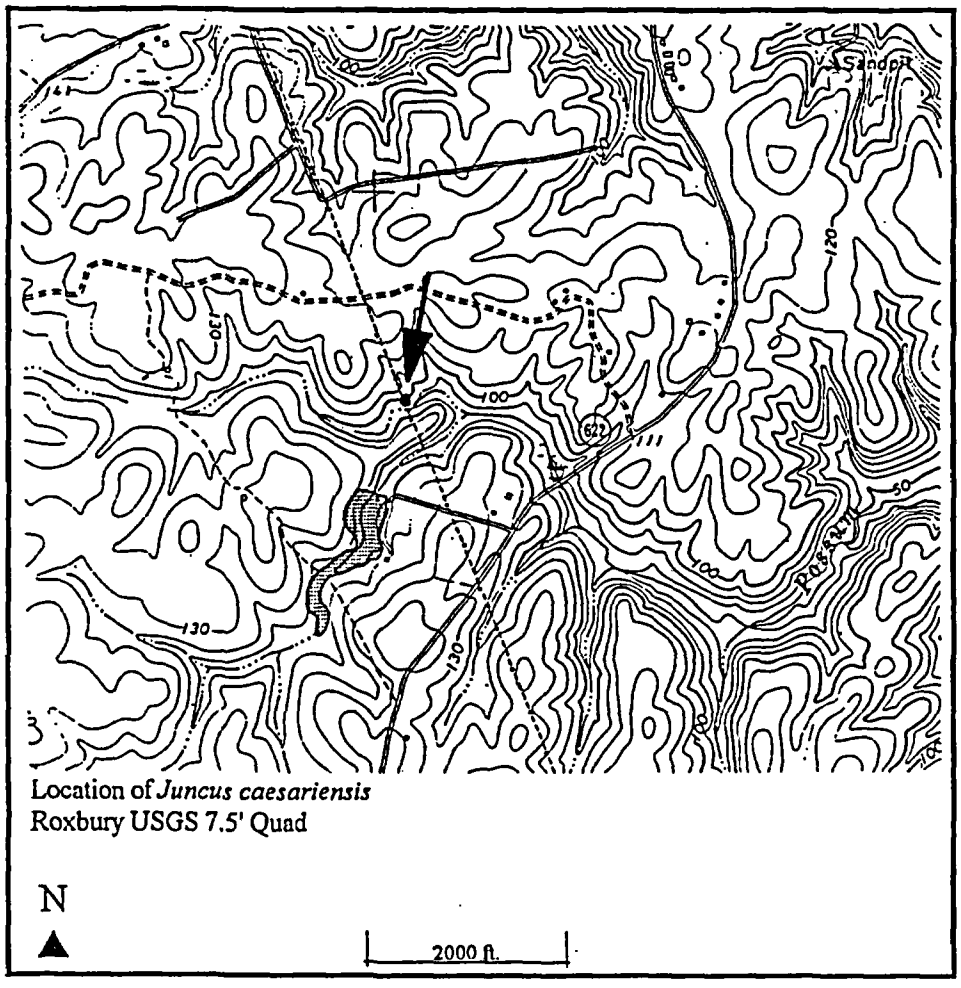
SCIENTIFIC NAME	COMMON NAME	GLOBAL RARITY RANK	STATE RARITY RANK	USFWS STATUS	VA LEGAL STATUS	ELEMENT OCCURRENCE RANK
Juncus caesariensis	New Jersey rush	G2	S2	SOC	--	D

SITE INFORMATION: This section of powerline right-of-way includes a shrubby, low-nutrient seepage on a south-facing slope. An opening in this shrubby seepage on the east side of the right-of-way supports one clump of the global rarity and USFWS Species of Concern (SOC)*Juncus caesariensis* (New Jersey rush). Species associated with the rare rush include *Andropogon glomeratus (*bushy bluestem), *Rhynchospora gracilenta* (slender beakrush), *Sphagnum* sp. (peatmoss), and *Magnolia virginiana* (sweetbay magnolia). A gas pipeline runs through the west side of the right-of-way and the west side consequently has suffered more disturbance.

The saturated, low-nutrient conditions in the seepage wetland inhibit woody plant growth and, in the past when fires were frequent , this site probably featured uplands of pine savannah surrounding wetlands with shrub bog vegetation. These vegetation types would have featured scattered trees and suitable, open habitat for *Juncus caesariensis*. Currently, fire suppression is actively practiced and dense hardwood forests and pine plantations are the predominant vegetation throughout the region. At this site, the *Juncus caesariensis* finds suitable habitat in the open transmission line corridor.

Current management of the powerline vegetation by Virginia Power appears to have benefited the rare species at the site.

POSSUM RUN SEEP -- RARE PLANT LOCATION



Location of *Juncus caesariensis*
Roxbury USGS 7.5' Quad

REEDY CREEK SEEPS

LOCALITY: Caroline County **QUADRANGLE:** Ruther Glen **QUADRANGLE CODE:** 3707784

LOCATION: Transmission powerline right-of-way intersecting Reedy Creek and its tributaries between Rts. 656 and 652, east of Ruther Glen.

RARE PLANT SUMMARY TABLE

SCIENTIFIC NAME	COMMON NAME	GLOBAL RARITY RANK	STATE RARITY RANK	USFWS STATUS	VA LEGAL STATUS	ELEMENT OCCURRENCE RANK
Juncus caesariensis (1)	New Jersey rush	G2	S2	SOC	--	BC
Juncus caesariensis (2)	New Jersey rush	G2	S2	SOC	--	C
Juncus caesariensis (3)	New Jersey rush	G2	S2	SOC	--	D
Mimosa quadrivalvis var. *angustata*	Little-leaf sensitive-briar	G5T5	S2	--	--	D
Platanthera blephariglottis var. *conspicua*	Large white fringed orchid	G4G5 T3T4	S1	--	--	D
Sarracenia purpurea	Purple pitcher-plant	G5T5	S2?	--	--	D

SITE INFORMATION: This section of powerline right-of-way intersects several shrubby seepage swales as well as xeric sandy uplands. Openings within a shrubby, low nutrient, north-facing seepage swale in the northern section of the site support a large population of the global rarity and USFWS Species of Concern (SOC) *Juncus caesariensis* (1) (New Jersey rush). Several sterile clumps of an introduced *Sarracenia* sp. (pitcher-plant) were found on the seepage slope in association with *Juncus caesariensis*. Openings in a shrubby seepage swale on a gentle north-facing slope adjacent to the main branch of Reedy Creek supports another population of *Juncus caesariensis* (2), as well as small populations of the state rarities *Platanthera blephariglottis* var. *conspicua* (large white fringed orchid) and *Sarracenia purpurea* (purple pitcher-plant). A clump of an introduced *Sarracenia* sp. was also present in the lower swale. The area with the *Platanthera blephariglottis* var. *conspicua* and *Sarracenia purpurea* appeared to have undergone some clearing or modification, possibly an attempt to "improve" the habitat for these species. Sheets of black plastic material have been dumped on the slope west of the swale near the upland vehicle trail. A third scrubby seepage swale in the southern section of the site supports a small population of *Juncus caesariensis* (3). The most prominent feature of the southernmost seepage swale in this site are the numerous clusters of introduced *Sarracenia* species/hybrids (pitcher-plants), some of which are very robust.

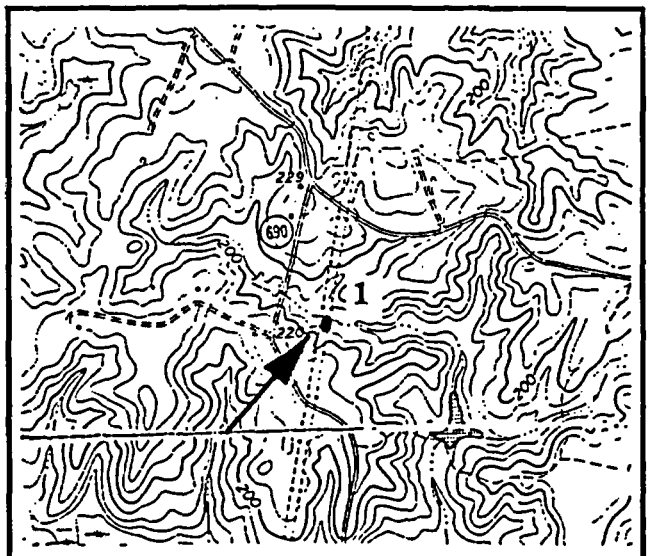
A xeric, sandy, southwest-facing slope in the southern section of the site supports a small population of the state rarity *Mimosa quadrivalvis* var. *angustata* (little-leaf sensitive-briar) in an area occasionally used as a vehicle trail.

The saturated, low-nutrient conditions in the seepage wetlands inhibit woody plant growth and, in the past when fires were frequent, this site probably featured uplands of pine savannah surrounding wetlands with shrub bog vegetation. These vegetation types would have featured scattered trees and suitable, open habitat for the plant rarities listed above. Currently, fire suppression is actively practiced and dense hardwood

forests and pine plantations are the predominant vegetation throughout the region. At this site, the rare plants still find suitable habitat in the open transmission line corridor.

Current management of the powerline vegetation by Virginia Power appears to have benefited the rare species at the site. Monitoring of the introduced *Sarracenia* plants is recommended. The black plastic material should be removed.

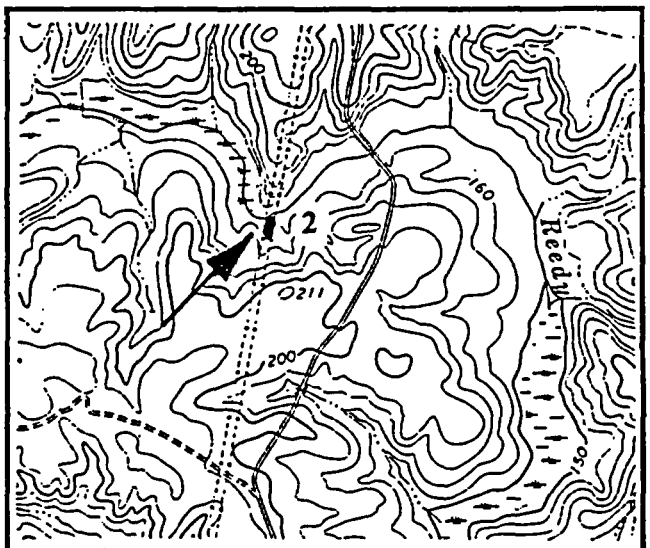
REEDY CREEK SEEPS -- RARE PLANT LOCATIONS



Location of *Juncus caesariensis* (1)
Ruther Glen USGS 7.5' Quad

N

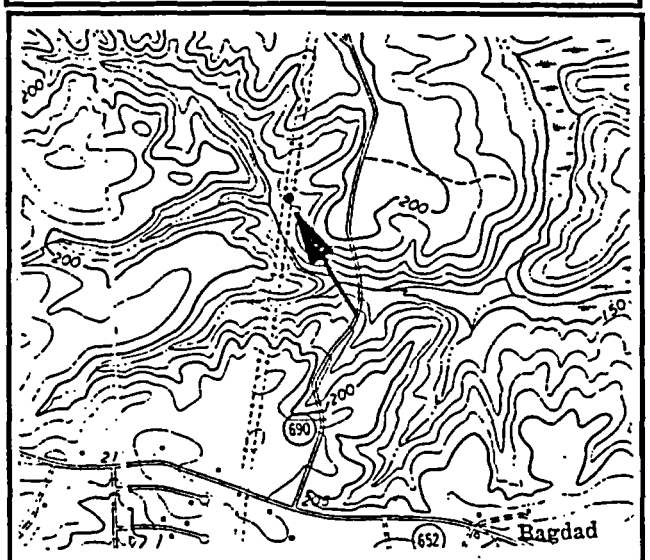
2000 ft.



Location of *Juncus caesariensis* (2), *Platanthera blephariglottis* var. *conspicua*, and *Sarracenia purpurea*
Ruther Glen USGS 7.5' Quad

N

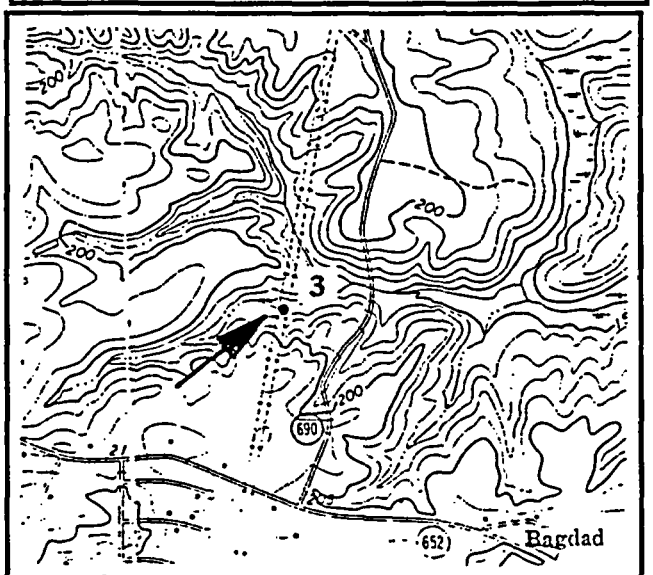
2000 ft.



Location of *Mimosa quadrivalvis* var. *angustata*
Ruther Glen USGS 7.5' Quad

N

2000 ft.



Location of *Juncus caesariensis* (3)
Ruther Glen USGS 7.5' Quad

N

2000 ft.

SALEM RUN BOG

LOCALITY: Charles City **QUADRANGLE:** Roxbury **QUADRANGLE CODE:** 3707742

LOCATION: Transmission powerline right-of-way intersecting upper tributaries of Salem Run, 0.6 km NW and 1.3 km NNW of the intersection of Rts. 609 and 650, NNE of Montpelier.

RARE PLANT SUMMARY TABLE

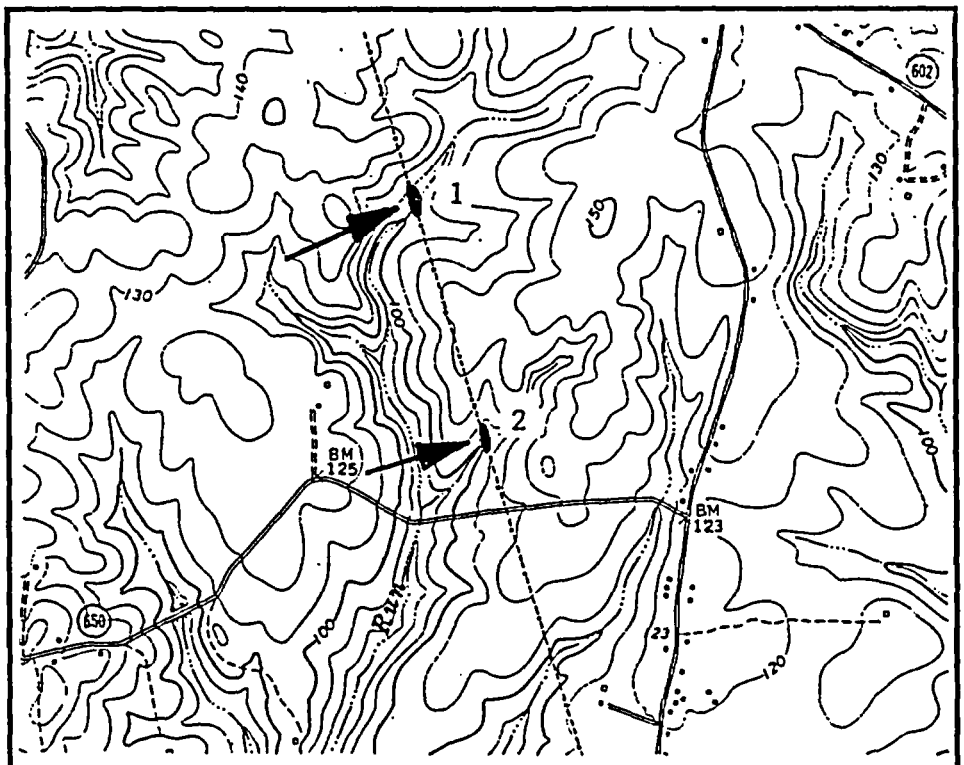
SCIENTIFIC NAME	COMMON NAME	GLOBAL RARITY RANK	STATE RARITY RANK	USFWS STATUS	VA LEGAL STATUS	ELEMENT OCCURRENCE RANK
Juncus caesariensis	New Jersey rush	G2	S2	SOC	--	BC

SITE INFORMATION: This section of powerline right-of-way intersects two sphagnous seepage slopes ca. 0.7 km apart and with varying amounts of open habitat. This open habitat supports two subpopulations of the globally rare and USFWS Species of Concern (SOC) *Juncus caesariensis* (New Jersey rush). Each subpopulation contained 200+ clumps. The northernmost seepage with subpopulation 1 contains a shrubby southern section, but a very open seepage slope in the northern section. The southernmost seepage with subpopulation 2 is more open with scattered shrubs. Associated species in these seepages include *Andropogon glomeratus* (bushy bluestem), *Rhynchospora* spp. (beakrushes), *Eleocharis* spp.(spikerushes), and *Xyris* spp. (yellow-eyed-grass).
A road runs through the sites and a culvert has been placed in the southern drainage but the hydrology of the seepage slopes does not appear to have been adversely affected.

The saturated, low-nutrient conditions in the seepage wetlands inhibit woody plant growth and, in the past when fires were frequent, this site probably featured uplands of pine savannah surrounding wetlands with shrub bog vegetation. These vegetation types would have featured scattered trees and suitable, open habitat for the plant rarities listed above. Currently, fire suppression is actively practiced and dense hardwood forests and pine plantations are the predominant vegetation throughout the region. At this site, the *Juncus caesariensis* still finds suitable habitat in the open transmission line corridor.

Current management of the powerline vegetation by Virginia Power appears to have benefited the rare species at the site.

SALEM RUN BOG -- RARE PLANT LOCATIONS



Location of *Juncus caesariensis* (subpopulations 1 and 2)
Roxbury USGS 7.5' Quad

N

2000 ft.

WRIGHTS CORNER

LOCALITY: Caroline County **QUADRANGLE:** Woodford **QUADRANGLE CODE:** 3807714

LOCATION: Powerline right-of-way intersecting headwater seepages in unnamed tributaries of the South River, 0.5 km SE and 0.2 km SW of Wrights Corner.

RARE PLANT SUMMARY TABLE

SCIENTIFIC NAME	COMMON NAME	GLOBAL RARITY RANK	STATE RARITY RANK	USFWS STATUS	VA LEGAL STATUS	ELEMENT OCCURRENCE RANK
Juncus caesariensis (1)	New Jersey rush	G2	S2	SOC	--	D
Juncus caesariensis (2)	New Jersey rush	G2	S2	SOC	--	D

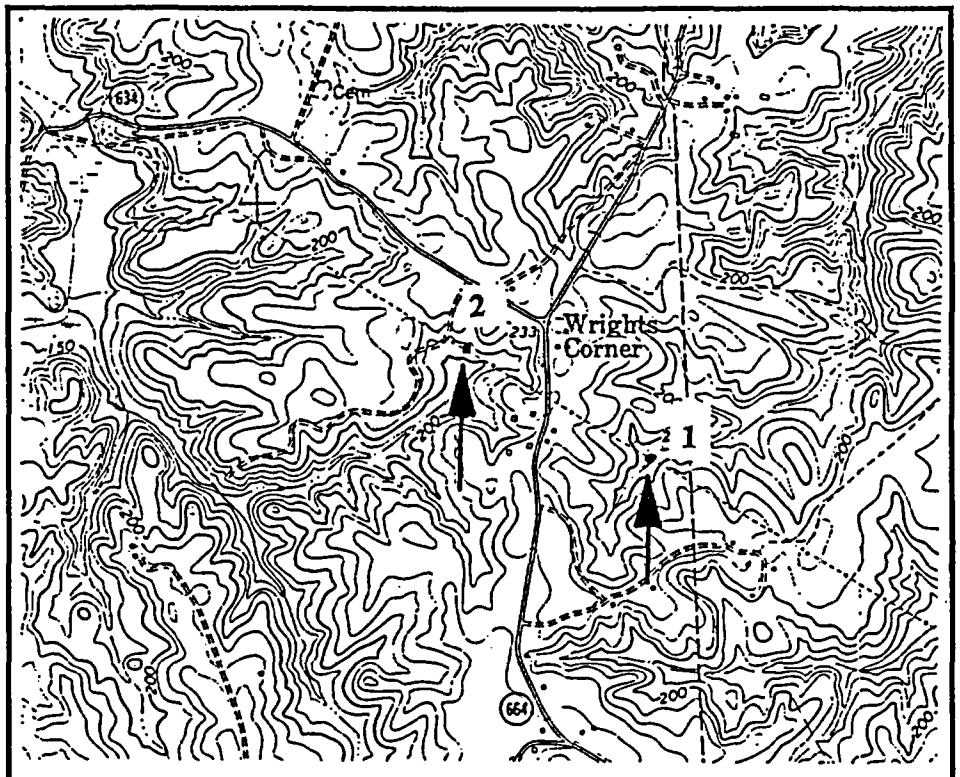
SITE INFORMATION: This section of powerline right-of-way intersects two headwater scrubby low-nutrient seepages with openings that support two small populations of the global rarity and USFWS Species of Concern (SOC) *Juncus caesariensis* (New Jersey rush). Species associated with *Juncus caesariensis* (1) east of Rt. 664 on the SW edge of the right-of-way include *Rhododendron viscosum* (swamp azalea), *Glyceria obtusa* (coastal mannagrass), *Sphagnum* sp.(peatmoss), and *Xyris torta* (twisted yellow-eyed-grass). Species associated with the population (2) west of Rt. 664, also on the SW edge of the right -of-way include *Clethra alnifolia* (sweet pepper-bush), *Osmunda cinnamomea* (cinnamon fern), *Rhynchospora gracilenta* (slender beakrush),and *Sphagnum* sp. (peatmoss).

One clump of an introduced *Sarracenia* sp. (pitcher-plant) was found in a narrow drainage 0.7 km northwest of the *Juncus caesariensis* (2) population.

The saturated, low-nutrient conditions in the seepage wetlands inhibit woody plant growth and, in the past when fires were frequent , this site probably featured uplands of pine savannah surrounding wetlands with shrub bog vegetation. These vegetation types would have featured scattered trees and suitable, open habitat for the plant rarities listed above. Currently, fire suppression is actively practiced and dense hardwood forests and pine plantations are the predominant vegetation throughout the region. At this site, the *Juncus caesariensis* still finds suitable habitat in the open transmission line corridor.

Current management of the powerline vegetation by Virginia Power appears to have benefited the rare species at the site. Monitoring of the introduced *Sarracenia* is recommended.

WRIGHTS CORNER -- RARE PLANT LOCATIONS



Locations of *Juncus caesariensis* (1) and (2)
Woodford USGS 7.5' Quad

WRIGHTS CORNER SOUTH

LOCALITY: Caroline County **QUADRANGLE:** Woodford **QUADRANGLE CODE:** 3807714

LOCATION: Transmission powerline right-of-way intersecting headwater seepages in unnamed tributary of Mays Run, ca. 0.5 km and 0.7 km NE of the junction of Rts. 639 and 664, 1.8 km S of Wrights Corner.

RARE PLANT SUMMARY TABLE

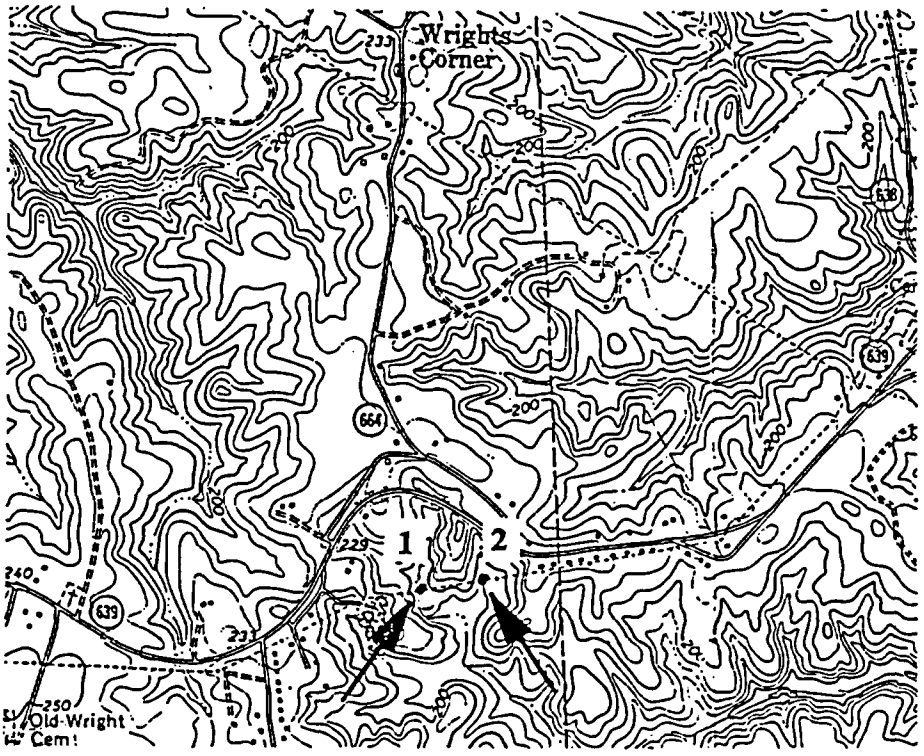
SCIENTIFIC NAME	COMMON NAME	GLOBAL RARITY RANK	STATE RARITY RANK	USFWS STATUS	VA LEGAL STATUS	ELEMENT OCCURRENCE RANK
Juncus caesariensis	New Jersey rush	G2	S2	SOC	--	C

SITE INFORMATION: This section of powerline right-of-way intersects two adjacent headwater low-nutrient scrubby seepages with openings that support two small subpopulations of the globally rare and USFWS Species of Concern (SOC) *Juncus caesariensis* (New Jersey rush). Some associated species include *Sphagnum* sp. (peatmoss), *Andropogon glomeratus* (bushy bluestem), *Clethra alnifolia* (sweet pepper-bush), *Rhynchospora gracilenta* (slender beakrush), *Juncus canadensis* (Canada rush), and *Lycopodiella alopecuroides* (foxtail clubmoss).

The saturated, low-nutrient conditions in the seepage wetlands inhibit woody plant growth and, in the past when fires were frequent , this site probably featured uplands of pine savannah surrounding wetlands with shrub bog vegetation. These vegetation types would have featured scattered trees and suitable, open habitat for the plant rarities listed above. Currently, fire suppression is actively practiced and dense hardwood forests and pine plantations are the predominant vegetation throughout the region. At this site, the *Juncus caesariensis* still finds suitable habitat in the open transmission line corridor.

Current management of the powerline vegetation by Virginia Power appears to have benefited the rare species at the site.

WRIGHTS CORNER SOUTH -- RARE PLANT LOCATIONS



Location of *Juncus caesariensis* (subpopulations 1 and 2)
Woodford USGS 7.5' Quad

DISCUSSION

The 1996 survey of Virginia's powerline rights-of-way continued to document the importance of these open-habitat corridors as refugia for rare plant species. Although far fewer rarities were encountered in 1996 than in 1995, this is due to the fact that the 1995 surveys had targeted more known rare plant sites and the powerline habitat of southeastern Virginia that is comparatively richer in rare plants. The 1996 surveys were productive, however, yielding new occurrences of two globally rare species *Juncus caesariensis* (New Jersey rush) and *Chelone cuthbertii* (Cuthbert turtlehead) as well as several occurrences of state rare species. Four new populations and one new subpopulation of a known occurrence of *Juncus caesariensis* were found in Caroline and Charles City Counties. Five previously known *Juncus caesariensis* populations were found to still be extant. One new occurrence of *Chelone cuthbertii* was found in Dinwiddie County.

Additional habitat remains to be surveyed for rare plants on powerline rights-of-way in Virginia. It is hoped that the long-term cooperative inventory between DCR-DNH and Virginia Power suggested in Ludwig (1996) continues, along with management and protection of the sites.

ACKNOWLEDGMENTS

This project was initiated by Virginia Power's Department of Environmental Policy and Compliance and Department of Forestry. In large part credit for this project is due to the initiative and guidance of Bill Bolin and Roger Leadman, respective directors in those departments.

Bill Bolin's continued assistance in 1996 in the provision of administrative and field support was indispensable. Rick Willis and Bill Bolin provided direct access and transportation to transmission line sites as well as generous support with field supplies. Johnnie Wallin provided location information for some of the sites surveyed. We thank these and other involved Virginia Power staff for their contributions to this project.

We also thank other DCR-DNH staff who were involved in aspects of the 1996 survey including Thomas Smith who assisted in field work, Megan Rollins who generated Figures 1 and 2, and Leslie Trew who reviewed this report.

REFERENCES

Code of Virginia. Virginia Natural Area Preserves Act, sections 10.1-209 *et seq*.

Fleming, G.P. 1993. An inventory for threatened and endangered species at Manassas Battlefield Park, Virginia. Natural Heritage Technical Report 93-25. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. Unpublished report submitted to National Park Service. 15 November 1993. 16 pp.

Ludwig, J.C. 1996. A rare plant inventory of southeastern Virginia powerline rights-of-way. Natural Heritage Technical Report 96-7. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. May, 1996. 63 pp. plus appendix.

APPENDIX 1.
EXPLANATION OF THE NATURAL HERITAGE RANKING SYSTEM

Each of the significant natural features (species, community type, etc.) monitored by DNH is considered an element of natural diversity, or simply an element. Each element is assigned a rank that indicates its relative rarity on a five-point scale (1 = extremely rare; 5 = abundant; Table 1). The primary criterion for ranking elements is the number of occurrences, i.e. the number of known distinct localities or populations. Also of great importance is the number of individuals at each locality or, for highly mobile organisms, the total number of individuals. Other considerations include condition of the occurrences, number of protected occurrences, and threats. However, emphasis remains on the number of occurrences, so that ranks essentially are an index of known biological rarity. These ranks are assigned in terms of an element's rarity within Virginia (its State or S-rank) and the element's rarity over its entire range (its Global or G-rank). Subspecies and varieties are assigned a Taxonomic (T-) rank in addition to their G-rank. Taken together, these ranks give an instant picture of an element's rarity. For example, a rank of G5/S1 indicates an element which is abundant and secure range-wide, but extremely rare in Virginia. Ranks for community types are provisional or lacking, due to ongoing efforts by the Natural Heritage network to classify community taxa. Rarity ranks used by DNH are not legal designations, and they are continuously updated to reflect new information.

Table 1. Definition of Natural Heritage state rarity ranks. Global ranks are similar, but refer to a species' range-wide status. Note that GA and GN are not used and GX means extinct. Sometimes ranks are combined (e.g., S1S2) to indicate intermediate or somewhat unclear status. Elements with uncertain taxonomic validity are denoted by the letter Q, after the global rank. Ranks for most community types have not been generated due to ongoing community classification efforts. These ranks should not be interpreted as legal designations.

S1	Extremely rare; usually 5 or fewer occurrences in the state; or may have a few remaining individuals; often especially vulnerable to extirpation.
S2	Very rare; usually between 5 and 20 occurrences; or few occurrences with many individuals; often susceptible to becoming endangered.
S3	Rare to uncommon; usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
S4	Common; usually more than 100 occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.
S5	Very common; demonstrably secure under present conditions.
SA	Accidental in the state.
SH	Historically known from the state, but not verified for an extended period, usually more than 15 years; this rank is used primarily when inventory has been attempted recently.
SN	Regularly occurring migrants or transient species which are non-breeding, seasonal residents. (Note that congregation and staging areas are monitored separately).

SU Status uncertain, often because of low search effort or cryptic nature of the element.

SX Apparently extirpated from the state

The spot on the landscape that supports a natural heritage resource is an **element occurrence**. DNH has mapped over 9,000 element occurrences in Virginia. Information on the location and quality of these element occurrences is computerized within the Division's BCD system, and additional information is recorded on maps and in manual files.

In addition to ranking each element's rarity, each element occurrence is ranked to differentiate large, outstanding occurrences from small, vulnerable ones. In this way, protection efforts can be aimed not only at the rarest elements, but at the best examples of each. Species occurrences are ranked in terms of quality (size, vigor, etc.) of the population; the condition (pristine to disturbed) of the habitat; the viability of the population; and the defensibility (ease or difficulty of protecting) of the occurrence. Community occurrences are ranked according to their size and overall natural condition. These **element occurrence ranks** range from A (excellent) to D (poor). Sometimes these ranks are combined to indicate intermediate or somewhat unclear status, e.g. AB or CD, etc. In a few cases, especially those involving cryptic animal elements, field data may not be sufficient to reliably rank an occurrence. In such cases a rank of E (extant) may be given. Element occurrence ranks reflect the current condition of the species' population or community. A poorly-ranked element occurrence can, with time, become highly-ranked as a result of successful management or restoration.

Element ranks and element occurrence ranks form the basis for ranking the overall significance of sites. Site **biodiversity ranks** (B-ranks) are used to prioritize protection efforts, and are defined as follows:

B1 Outstanding Significance: only site known for an element; an excellent occurrence of a G1 species; or the world's best example of a community type.

B2 Very High Significance: excellent example of a rare community type; good occurrence of a G1 species; or excellent occurrence of a G2 or G3 species.

B3 High Significance: excellent example of any community type; good occurrence of a G3 species.

B4 Moderate Significance: good example of a community type; excellent or good occurrence of state-rare species.

B5 General Biodiversity Significance: good or marginal occurrence of a community type or state-rare species.

Note: sites supporting rare subspecies or varieties are considered slightly less significant than sites supporting similarly ranked species.

The U.S. Fish and Wildlife Service (USFWS) is responsible for the listing of endangered and threatened species under the Endangered Species Act of 1973, as amended. Federally listed species (including subspecific taxa) are afforded a degree of legal protection under the Act, and therefore sites supporting these

species need to be highlighted. USFWS also maintains a review listing of potential endangered and threatened taxa known as candidate species and species of concern. Table 2 illustrates the various status categories used by USFWS and followed in this report. The status category of species is based largely on the Service's current knowledge about the biological vulnerability and threats to a species.

In Virginia, two acts have authorized the creation of official state endangered and threatened species lists. One act (section 29.1-563 through 570, Code of Virginia), administered by the Virginia Department of Game and Inland Fisheries (DGIF), authorizes listing of fish and wildlife species, not including insects. The other act (section 3.1-1020 through 1030, Code of Virginia), administered by the Virginia Department of Agriculture and Consumer Services (VDACS), allows for listing of plant and insect species. In general, these acts prohibit or regulate taking, possessing, buying, selling, transporting, exporting, or shipping of any endangered or threatened species appearing on the official lists. Species protected by these acts are indicated as either listed endangered (LE) or listed threatened (LT). Species under consideration for listing are indicated as candidates (C).

Table 2. U.S. Fish and Wildlife Service species status codes, with abbreviated definitions.

LE	Listed endangered
LT	Listed threatened
PE	Proposed to be listed as endangered
PT	Proposed to be listed as threatened
S	Synonyms
C	Candidate: status data supports listing of taxon as endangered or threatened, but listing has been delayed by pending proposals of higher priority taxa.
SOC	Species of Concern: evidence of vulnerability, but insufficient status data exists.